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Following the polar cap magnetic field and heliospheric current sheet as Ulysses descends in latitude.

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After passing a maximum north latitude of 80.2° in December 2001, Ulysses has been descending gradually back down to 25° N, a time interval

corresponding to 17 solar rotations and the on-going decline in solar activity.

It is expected that the strength of the sun's axial dipole magnetic field has been increasing steadily, after having recently reversed polarity, while the orientation of the heliospheric current sheet decreases from being almost poleward to a more equatorial inclination. Ulysses provides measures of both the open magnetic flux and the expansion factor associated with the fast wind from the north polar coronal hole. Estimates of the polar cap field strength and its changes over time are obtainable from these two measures (assuming the open flux remains independent of latitude as in the past).

These derived values can be compared with estimates obtained by other means. The evolving latitude of the current sheet can also be followed and compared with the sunspot number, with which it has been closely correlated in the past, and with the neutral line predicted by source surface models. Thus, these unique observations can provide quantitative measures, and test our knowledge, of these important properties of the high latitude heliosphere.